October 6, 2008

Mr. Thomas L. Williamson
Manager, GGNS COLA Project
Entergy Nuclear
1340 Echelon Parkway
Jackson, MS 39213

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 09 RELATED TO SRP SECTION 12.02 FOR THE GRAND GULF COMBINED LICENSE APPLICATION

Dear Mr. Williamson:

By letter dated February 27, 2008, Entergy Operations Incorporated (EOI) submitted for approval a combined license application pursuant to 10 CFR Part 52. The U. S. Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed application.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter. To support the review schedule, you are requested to respond within 30 days of the date of this letter. If changes are needed to the safety analysis report, the staff requests that the RAI response include the proposed wording changes.

If you have any questions or comments concerning this matter, I can be reached at 301-415-2890 or by e-mail at Andrea.Johnson@nrc.gov.

Sincerely,

/RA/

Andrea M. Johnson, Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket No. 052-0024
eRAI Tracking No. 896, 1005, 902, 1068

Enclosure:
Request for Additional Information

October 6, 2008

Mr. Thomas L. Williamson
Manager, GGNS COLA Project
Entergy Nuclear
1340 Echelon Parkway
Jackson, MS 39213

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 09 RELATED TO SRP SECTION 12.02 FOR THE GRAND GULF COMBINED LICENSE APPLICATION

Dear Mr. Williamson:

By letter dated February 27, 2008, Entergy Operations Incorporated (EOI) submitted for approval a combined license application pursuant to 10 CFR Part 52. The U. S. Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed application.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter. To support the review schedule, you are requested to respond within 30 days of the date of this letter. If changes are needed to the safety analysis report, the staff requests that the RAI response include the proposed wording changes.

If you have any questions or comments concerning this matter, I can be reached at 301-415-2890 or by e-mail at Andrea.Johnson@nrc.gov.

.

Sincerely,
/RA/
Andrea M. Johnson, Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket No. 052-0024
eRAI Tracking No. 1041, 1051, 1060, 1050
Enclosure:
Request for Additional Information
Distribution:
PUBLIC
BSosa, NRO
MTonacci, NRO
BAbeywickrama, NRO
AJohnson, NRO
CHinson, NRO
TFrye, NRO
SBrock, OGC
NRO_DNRL_NGE2
NRO_DNRL_NGE1

ADAMS Accession No. ML082800261 NRO-002

OFFICE	CHPB/TR	CHPB/BC	OGC	NGE2/L-PM
NAME	CHinson	TFrye	SBrock	MTonacci
DATE	08/25/08	09/18/08	09/26/08	10/06/08

*Approval captured electronically in the electronic RAI system.

OFFICIAL RECORD COPY

Grand Gulf, Unit 3 COLA
Entergy Operations, Inc.
Docket No. 52-024
SRP Section: 12.02 - Radiation Sources
Application Section: FSAR Sections:
12.2.2.2.2, 12.2.2.2.4, 12.2.2.2.3, 12.2.2.2.3, and
12.2.2.4

QUESTIONS

12.02-1

FSAR Subsections 12.2.2.2.2 and 12.2.2.4.2, Grand Gulf Nuclear Station (GGNS) COL 12.2-2A and 12.2-3-A, includes by reference, the draft NEI Template 07-11. The NEI Template was expected to present a bounding envelope of the population doses associated with the gaseous and liquid effluent releases, which if met, would demonstrate compliance with ALARA cost benefit requirement of Section II.D of Appendix I to 10 CFR Part 50. However, this Template has been withdrawn, and it is not any longer a relevant reference. Accordingly, provide an updated cost-benefit analysis in the applicable FSAR sections.

12.02-2

FSAR Subsection 12.2.2.2.3, Compliance with 10 CFR Part 20.1301, presents the analysis of doses to the maximally exposed individual and compares dose results against the EPA environmental dose standards of 40 CFR Part 190, as implemented under Part 20.1301(e). The discussion is presented in FSAR pages 12-4 and 12-5. Although the discussion points out that the dose calculated in the Early Site Permit (SSAR Table 3.2-3B and 3.2-5) from direct external radiation has been considered in the evaluation, it is not clear if the FSAR analysis did consider increased external radiation levels at the nearest residence associated with the operation of hydrogen water chemistry system. DCD Tier 2, Revision 4, Section 12.2.1.3 of DCD acknowledges increased external radiation levels whenever hydrogen water chemistry is used, and it presents the results of a generic analysis (Table 12.2-21) using arbitrary site conditions and distances. Accordingly, update the Grand Gulf Unit 3 plant and site-specific analysis to demonstrate that, when the N-16 dose is added to the dose contribution from all other direct sources of external radiation to the nearest residence, the sum of direct sources of radiation will not exceed the dose standards of 40 CFR Part 190 and 10 CFR Part 20.1301(e).

12.02-3

FSAR Subsection 12.2.2.2.3 presents compliance with 10CFR20 Appendix B for gaseous effluent concentrations at the site boundary.

a. A review of gaseous effluent releases indicates inconsistencies in the assigned release values for several radionuclides. The ESBWR DCD, Rev. 5 Table 11.1-5b provides the expected normal operational non-volatile fission product concentrations in the reactor coolant, indicating several nuclide pairs in secular equilibrium. These include: Sr-90/Y-90, Zr-95/Nb-95, Mo-99/Tc-99m, Ru-103/Rh-103m, Ru-106/Rh-106, Ba-140/La-140, and Ce-144/Pr-144. Gaseous released quantities for these nuclides should be of the same magnitude. Review of the gaseous

effluents in the FSAR Table 12.2-206 indicates large differences in release values for these pairs except for the Ce-144/Pr-144 releases. Accordingly, update the released quantities for the affected nuclides to be consistent with their parent values, and revise Table 12.2-206, as necessary.

b. In demonstrating compliance with the unity rule of Table 2 (Column 1) of Appendix B to 10 CFR Part 20, add a column to FSAR Table 12.2-206 showing the ratio of each radionuclide and the sum-of-the-ratios for all radionuclides. Currently, the tabulation does not present the sum-of-the-ratios. Accordingly, provide an updated Table 12.2-206 showing the nuclide concentration ratios over values of Table 2 of Appendix B to 10CFR20, and compliance with the unity rule.

c. Please correct the site boundary value to 8.8E-06 (i.e., it is incorrectly listed as 8.8E 06).

d. Table 12.206 indicates a composite tritium release of 2.81E+08 MBq/yr (or 76000 Ci/yr), whereas the corresponding value in Table D-7 of Grand Gulf ESP-02, which is the source for the composite value, is 7,060 Ci/yr (or 2.61E+08 MBq/yr). Correct the cited value in Table 12.206 to 2.61E+08.

12.02-4

A review of FSAR Section 12.2.2.4 indicates inconsistencies and lack of details in the presentation of supporting data as compared with the ESBWR DCD, Tier 2 Rev. 5. Specifically, please address and resolve the following items in the Grand Gulf Unit 3 FSAR:

a. The FSAR uses a different liquid discharge flow rate as compared to that used in the ESBWR DCD, Rev. 4, even though it refers back to the ESBWR DCD Table 12.2-19b for source term and concentration. The DCD uses an outfall (dilution) flow rate of 20,000 liters per minute, whereas the FSAR Table 12.2-201 indicates a dilution flow rate of 7,000 gpm, or about 26,500 liters per minute. In demonstrating consistency with the unity rule of Table 2 (Column 2) of Appendix B to 10 CFR Part 20, please update the FSAR by listing in a tabular format, the liquid discharge nuclide concentrations, along with comparisons to the corresponding values in Table 2 of 10 CFR part 20 Appendix B, for consistency with the unity rule.

b. A review of the ESBWR DCD, Rev. 5 Table 12.2-19b indicates that the source term (MBq/yr) is based on a plant capacity factor of 0.8 while the ESBWR design capacity factor is 0.92 (DCD Table 12.2-15). A higher capacity factor would result in an increased reactor coolant system radiological inventory and thereby the potential for higher released quantities. Therefore, the radiological release values (i.e., source term) are expected to be higher by a factor of 1.15 (0.92/0.8). The use of the increased capacity factor would lead to a proportionally higher liquid dose offsite. Since applicant has used the liquid source term given in the ESBWR DCD, Rev. 4 Tier 2, Table 12.2-19b, the use of these values in the FSAR requires a note stating that the source term is based on the capacity factor of 0.80. The inclusion of such note in the FSAR would make the presentation of this information consistent with the corresponding offsite dose values presented in Table 12.2-203. Accordingly, please add a footnote to the tabular information requested as part of item “a” above, indicating that the source term is based on a capacity factor of 0.80.

c. FSAR Table 12.2-201 indicates an effluent discharge flow rate of 35 gpm. The same flow rate is also provided on Page D-3 of ESP-002 which is referenced in the FSAR. However, the effluent

discharge flow rate presented in the water balance figure (i.e., Figure 3.3-201 of “Grand Gulf Nuclear Station Unit 3, Combined License Application, Environmental Report, Revision 0 February 2008”) indicates a liquid radwaste wastewater (stream No. 16) flow rate of 98 gpm. A stream with 35 gpm (stream No. 7) is labeled as sanitary wastewater system on the same figure. Please confirm that the cited flow rate for the liquid effluent discharge rate is correct. Otherwise, please list the correct value in an updated the FSAR Table 12.2-201.